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Clustering of Waveforms Based on FPCA Direction

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Abstract. Looking for curves similarity could be a complex issue characterized by subjective choices related to continuous transformations of observed discrete data (Chiodi, 1989). Waveforms correlation techniques have been introduced to characterize the degree of seismic event similarity (Menke, 1999) and in facilitating more accurate relative locations within similar event clusters by providing more precise timing of seismic wave (P and S) arrivals (Phillips, 1997).

In this paper functional analysis (Ramsey, and Silverman, 2006) is considered to highlight common characteristics of waveforms-data and to summarize these characteristics by few components, by applying a variant of a classical clustering method to rotated data (Sangalli *et al.*, 2010) according to the direction of maximum variance (i.e. based on PCA rotation of data).

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Keywords

FPCA, clustering of curves, waveforms